

CLAIMS

1. A sparse array antenna comprising series-fed antenna array columns tuned to a respective transmit and receive frequency, **characterised in** that transmitting and receiving array columns are formed with a given distance between each transmitting radiator element and each receiving radiator element, the series-fed antenna columns being arranged in parallel to each other, thereby forming a symmetric interleaved transmit/receive array;
receiving array columns operate as parasitic elements in a transmit mode and transmitting array columns operate as parasitic elements in a receive mode, thereby reducing creation of grating lobes.
2. The antenna according to claim 1, **characterised in** that a distance between each transmitting antenna array column and each receiving antenna array column is typically increased to be of an order of one wavelength (λ) to thereby obtain a sparse array.
3. The antenna according to claim 2, **characterised in** that the series-fed array columns are formed as extended ridged slotted wave-guides tuned to a respective transmitting and receiving frequency.
4. The antenna according to claim 3, **characterised in** that when having number n of slots in each slotted transmitting wave-guide the number of slots in each slotted receiving wave-guide being generally $n \pm x$, where x represents an integer digit ($x = 0, 1, 2, 3 \dots$).
5. The antenna according to claim 2, **characterised in** that the series-fed array columns are formed as extended transmission lines containing radiation elements, the array columns being tuned to a respective transmitting and receiving frequency.

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6. The antenna according to claim 1, **characterised in** that the sparse array antenna is arranged to be scanable to also provide reduced sidelobes entering visual space when scanning the main radiation lobe from an off boresight direction.

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7. The antenna according to claim 1, **characterised in** that that each one of the series-fed antenna column is narrowly tuned within a respective frequency band to thereby reduce coupling between the transmitting and receiving bands used.

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8. The antenna according to anyone of the preceding claims, **characterised in** that the series-fed antenna array columns are connected to and fed from an active receive/transmit (T/R) module.

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9. The antenna according to claim 2, **characterised in** that only one set of series-fed columns being actively used and another interleaved set of series-fed columns are terminated by a suitable load forming parasitic columns of the sparse array antenna.